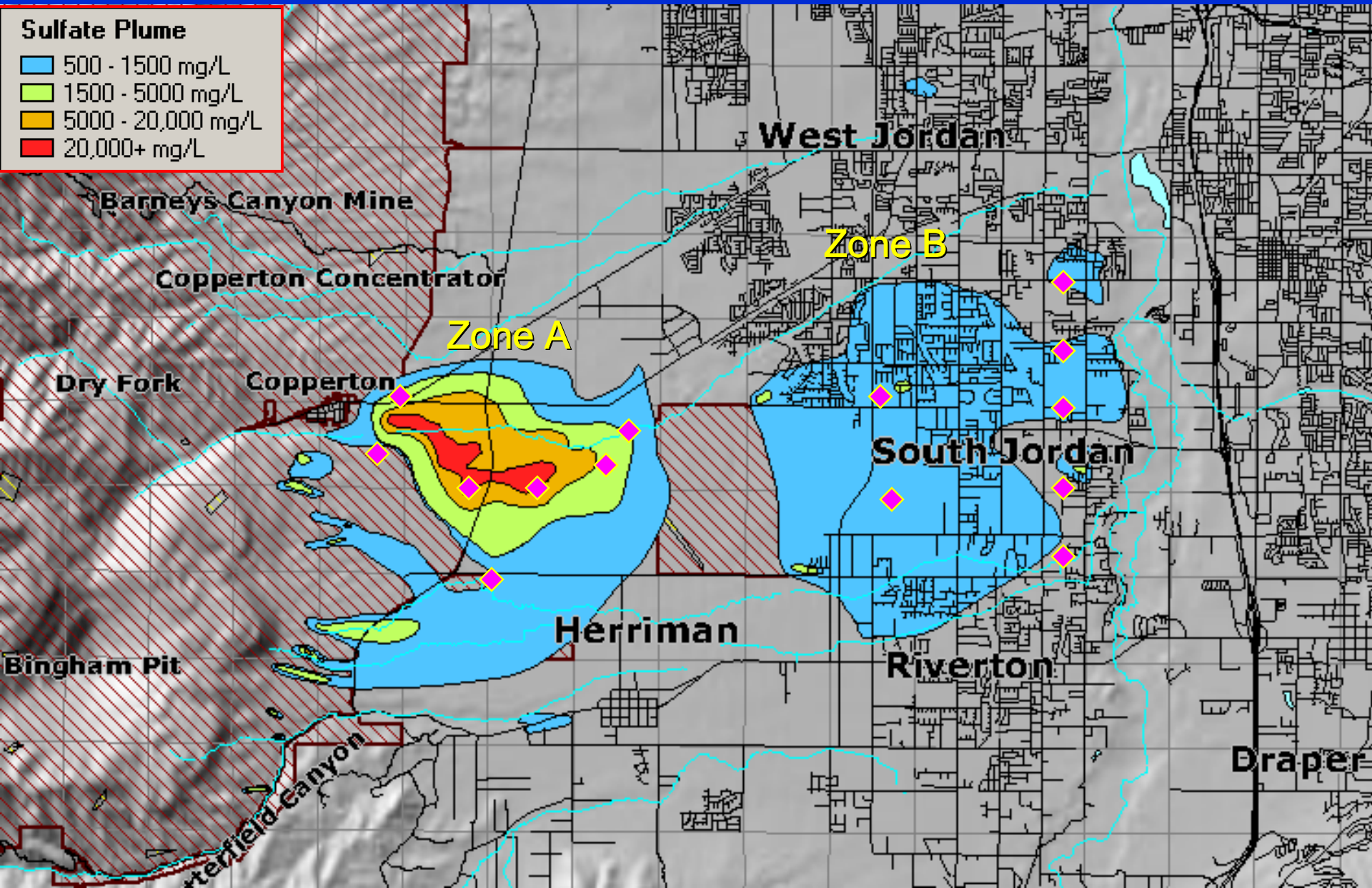
# KUCC and JVWCD Joint Proposal to the State Trustee for Natural Resource Damages to the Southwestern Jordan Valley Aquifer

**Public Hearings**

**September 10, 2003 – West Jordan**

**September 25, 2003 - DEQ**

# ZONE A AND ZONE B SULFATE PLUMES



# State Natural Resource Damage (NRD) Trust Fund (Millions)

| Date | Irrevocable Letter of Credit[a] | Lost Use Payment [b] | Total |
|---|---|---|---|
| **September 1995** | **$28.0** | **$9.0** | **$37.0** |
| **September 2003** | **$48.1** | **$13.2** | **$61.3** |

(a) Increases at 7% annually
(b) Invested in Public Treasurer Investment Fund

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# SCOPE AND PURPOSE OF JOINT PROPOSAL

- Seeks to use all portions of Trust Fund
- NRD and CERCLA Obligations
  - Extract contaminated groundwater from the acid plume at a minimum rolling 5-yr average of 400 ac-ft/yr
  - Complete source control measures
  - Produce 8,235 ac-ft/yr of Municipal Quality Water (MQW)
    - from the extracted water by Reverse Osmosis (RO) Treatment
    - delivery of the treated water to affected municipalities
  - Contain sulfate contaminated groundwater >1500 mg/L on Kennecott property via groundwater extraction
  - Prevent or reduce spread of aquifer contamination

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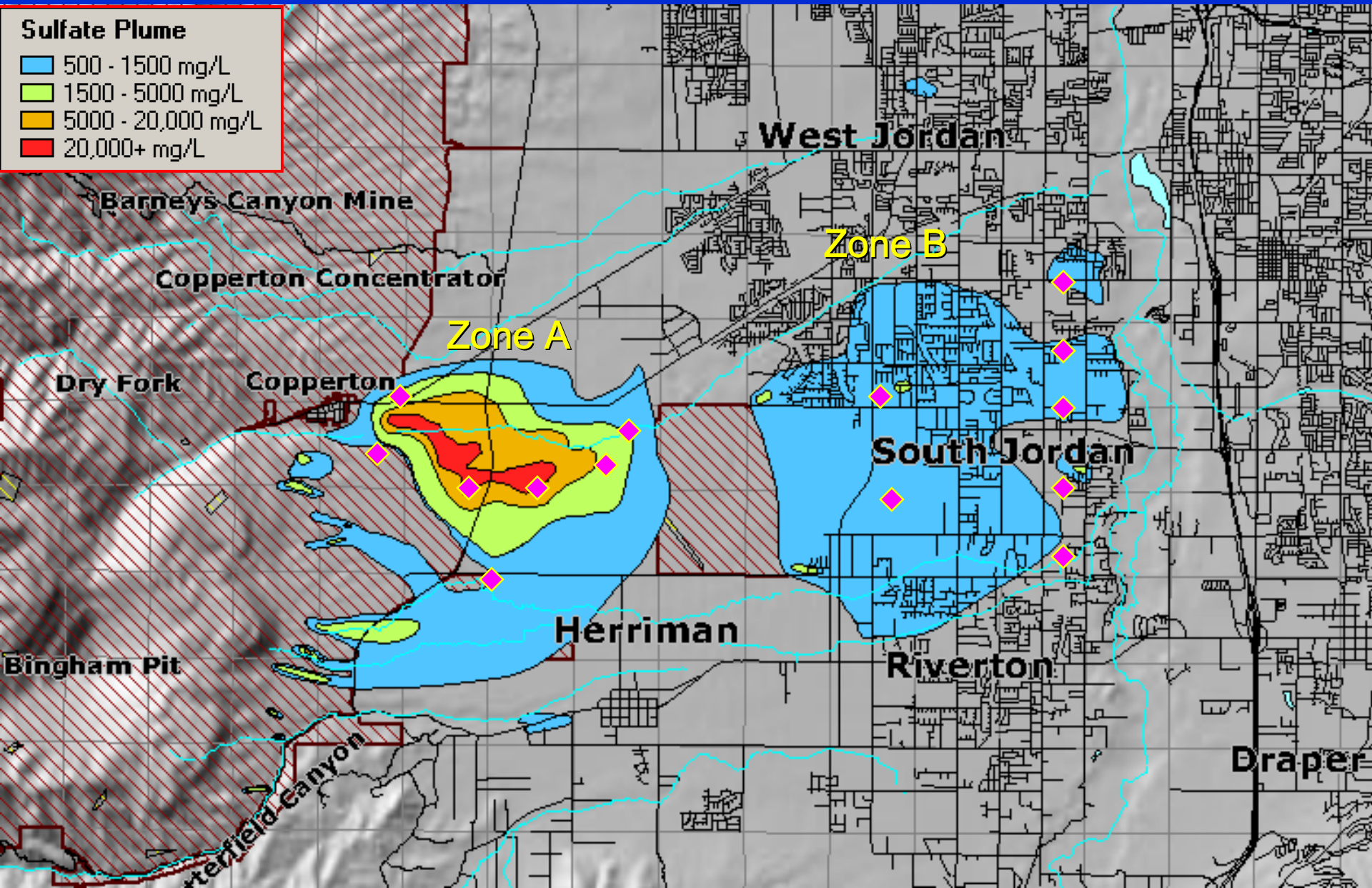
# ZONE A AND ZONE B SULFATE PLUMES



# KUCC Source Control Activities

- Zone A
  - Eastside Collection System – mid 1990s
  - Large Bingham Reservoir replacement early 1990s
  - Termination of active leaching operations – Sept 2000
  - Various contaminated soils removal projects
- Zone B
  - South Jordan Evaporation Ponds removal

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# Kennecott/JVWCD Proposal

**Three Main Components:**

- Zone A Plant
  - Funded by Kennecott and JVWCD
  - Constructed, owned and operated by Kennecott
  - Produce 3500 ac-ft/yr of Municipal Quality Water
  - From Kennecott water rights
- Zone B Plant
  - Funded by Kennecott and JVWCD
  - Constructed, owned and operated by JVWCD
  - Produce 3500 ac-ft/yr of drinking water
  - From JVWCD water rights
- "Lost use" component
  - Produce 1235 to 2300 ac-ft/yr of drinking water
  - From JVWCD water rights
- All water delivered to the affected municipalities through JVWCD system

# Zone A RO Filtration of Sulfate Plume Water

## 2002 Typical Analyses

| Parameter | UOM | Product Water | DW Standard | By-product | PERMIT LIMIT 30-day ave / daily max | |
|---|---|---|---|---|---|---|
| Arsenic | µg/L | < 5 | 50/10 | 23 | 250 | 500 |
| Cadmium | µg/L | < 1 | 5 | < 1 | 50 | 100 |
| Copper | µg/L | < 20 | 1300 | 97 | 150 | 300 |
| Lead | µg/L | < 5 | 15 | < 5 | 300 | 600 |
| Selenium | µg/L | < 2 | 50 | 36 | 54 | 54 |
| Sulfate | mg/L | 102 | 1000 | 6,683 | WET Testing | |
| Zinc | µg/L | < 10 | 5000 | 86 | 224 | 500 |
| TDS | mg/L | <250 | 2000 | 12,000 | WET Testing | |
| pH | su | 7.0 | 6.5 - 8.5 | 7.7 | 6.5 - 9.0 | |

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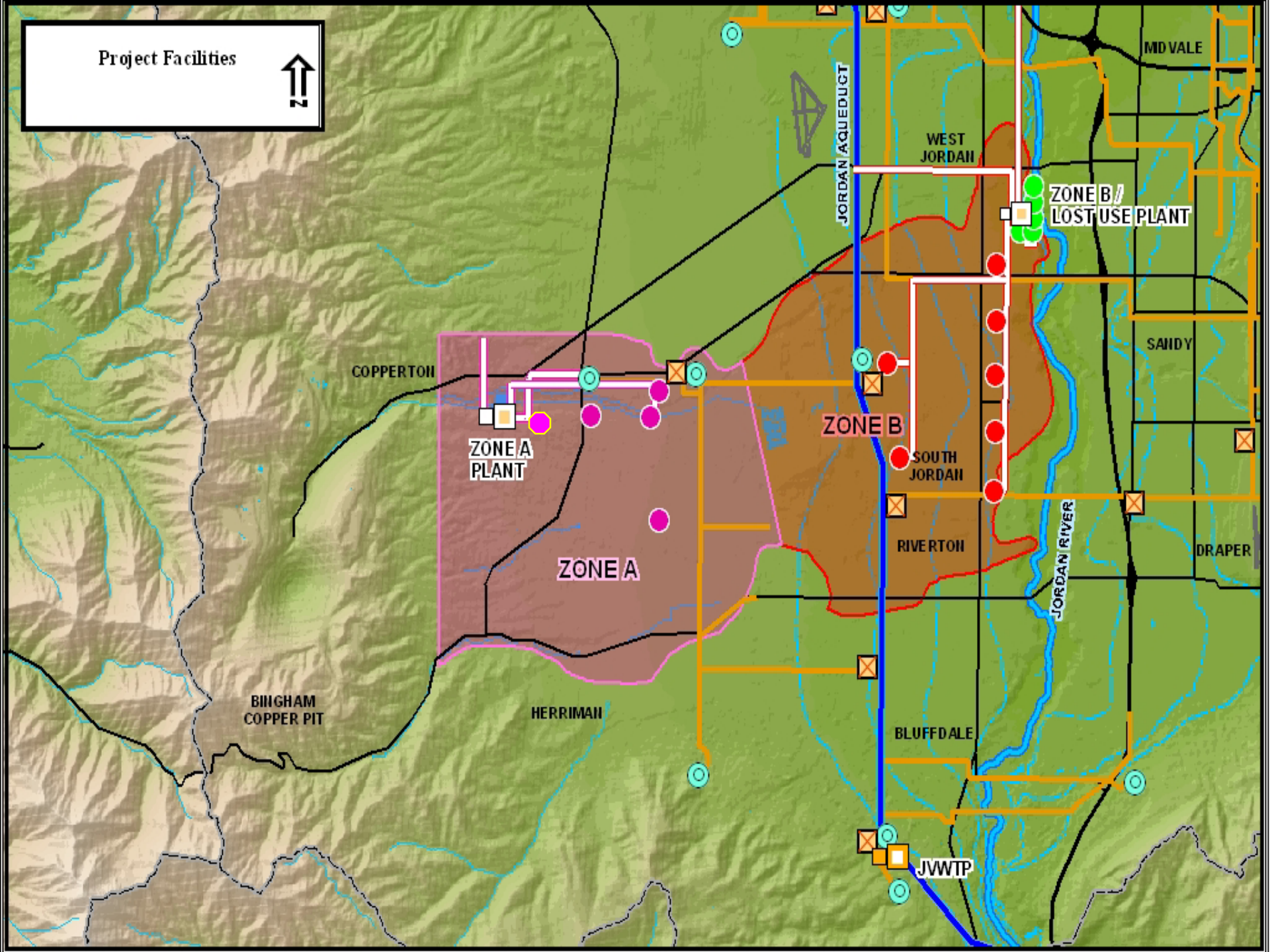
# Zone A RO Plant Site – Looking West


Project Facilities
N
MIDVALE
JORDAN AQUEDUCT
WEST JORDAN
ZONE B / LOST USE PLANT
SANDY
COPPERTON
ZONE A PLANT
ZONE B
SOUTH JORDAN
RIVERTON
JORDAN RIVER
DRAPER
ZONE A
BINGHAM COPPER PIT
HERRIMAN
BLUFFDALE
JVWTP

# Project Actions to Date

- All source controls completed and operating
- Extraction of sulfate contaminated water at 3200 gpm from Zone A
- *Total current acid extraction ~1500 gpm, or 6 times NRD minimum*
  - *~98 million pounds sulfate removed last year*
- Significant reductions in sulfate concentrations in majority of Zone A plume area
- Pilot testing of Zone A and Zone B RO Plants
- Final Remedial Design submitted to EPA, DEQ and TRC
- Design/Construction underway for Zone A RO Plant
- 50% Capacity on-line before end of 2003 for Zone A RO Plant

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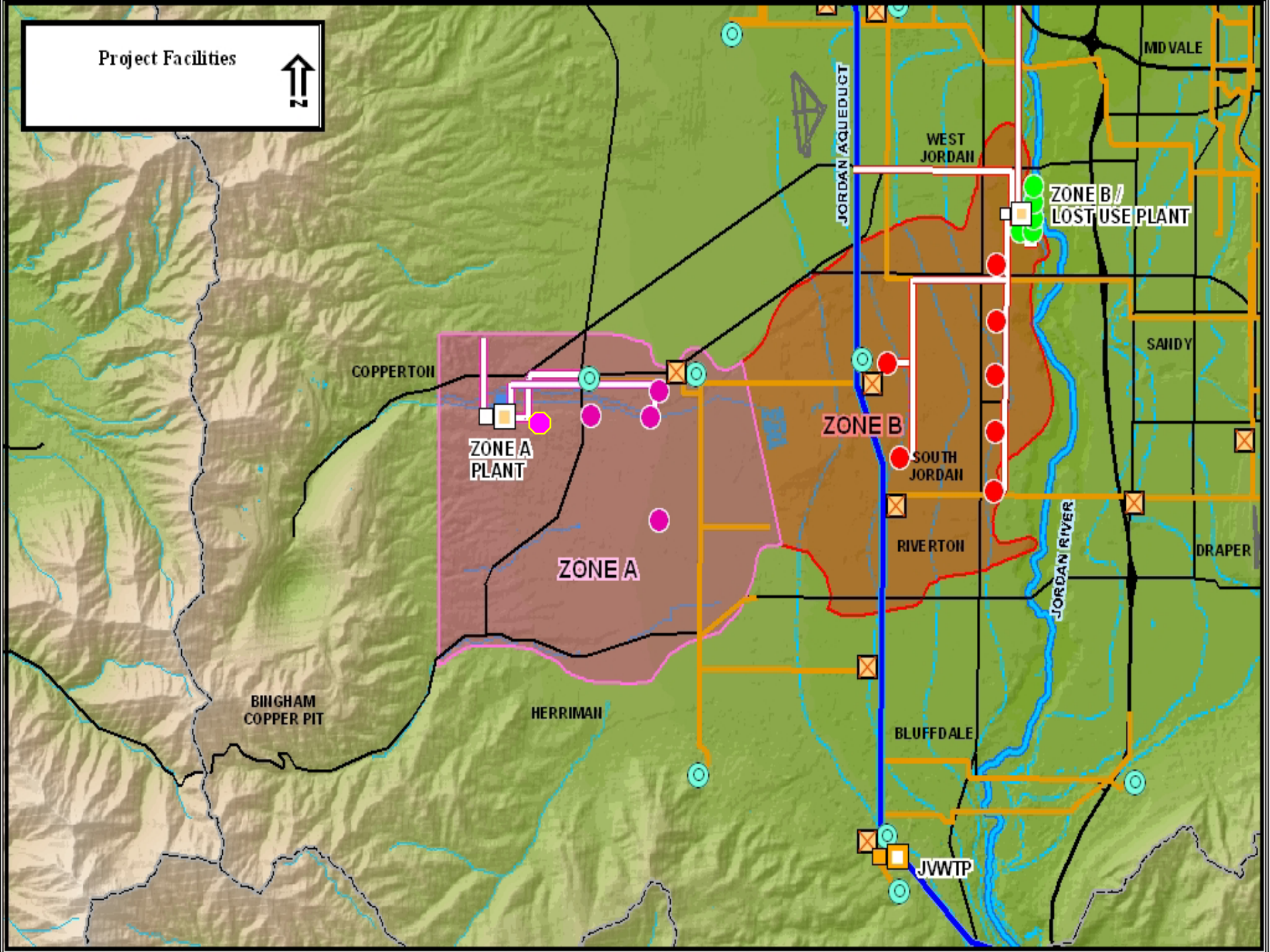
# Zone B/Lost Use Treatment Plant Site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ZONE A PLANT
ZONE B
SOUTH JORDAN
RIVERTON
JORDAN RIVER
DRAPER
ZONE A
BINGHAM COPPER PIT
HERRIMAN
BLUFFDALE
JVWTP


RO Plant

# Zone B RO Filtration of Sulfate Plume Water

## 2002 Typical Analyses

| Parameter | UOM | Product Water | DW Standard | By-product | PERMIT LIMIT Daily max |
|---|---|---|---|---|---|
| Arsenic | µg/L | < 5 | 50/10 | 20 | 190 |
| Cadmium | µg/L | < 1 | 5 | 2.5 | 4.4 |
| Copper | µg/L | < 20 | 1300 | 22 | 32 |
| Lead | µg/L | < 5 | 15 | 2.5 | 28 |
| Selenium | µg/L | < 2 | 50 | 20 | 48.5 |
| Sulfate | mg/L | 56 | 1000 | 3100 | WET Testing |
| Zinc | µg/L | < 10 | 5000 | 25 | 257 |
| TDS | mg/L | <250 | 2000 | 8,304 | 8350 |
| pH | su | 8.2 | 6.5 - 8.5 | 7.7 | 6.5 - 9.0 |

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# Lost Use RO Filtration of Shallow Groundwater

## 2002 Typical Analyses

| Parameter | UOM | Product Water | DW Standard | By-product | PERMIT LIMIT Daily max |
|---|---|---|---|---|---|
| Arsenic | µg/L | < 5 | 50/10 | 20 | 190 |
| Cadmium | µg/L | < 1 | 5 | 2.5 | 4.4 |
| Copper | µg/L | < 20 | 1300 | 18 | 32 |
| Lead | µg/L | < 5 | 15 | 25 | 28 |
| Selenium | µg/L | < 2 | 50 | 20 | 48.5 |
| Sulfate | mg/L | 56 | 1000 | 1800 | WET Testing |
| Zinc | µg/L | < 10 | 5000 | 2.5 | 257 |
| TDS | mg/L | <250 | 2000 | 8232 | 8350 |
| pH | su | 8.2 | 6.5 - 8.5 | 7.7 | 6.5 - 9.0 |

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# Project Water Allocation

- Zone A water – internally subsidized with Trust Fund
- Zone B water – cost efficiency through JVWCD system
- Zone A and B water committed to Affected Public for 40 yrs

## Zone A Water Allocation

| Affected Municipality | Allocation | Annual Volume (AF) | Flow Rate (mgd) |
|---|---|---|---|
| West Jordan | 35% | 1225 | 1.2 |
| South Jordan | 30% | 1050 | 1.0 |
| Riverton City | 20% | 700 | 0.7 |
| Herriman City | 15% | 525 | 0.5 |

Distribution based on population projections

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# Project Schedule

| Activity | Completed by |
| --- | --- |
| Public Hearings/Comment | September 2003 |
| Trustee approval, agreements execution | 4th Quarter 2003 |
| Design/Construction | Underway – 4th Quarter 2006 |
| Startup/testing, Complete and Operational | Zone A – Dec 2005<br>Zone B – 2nd Quarter 2007 |

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# PROJECT BENEFITS
## (Required by Consent Decree)

- Treats contaminated water
- Delivers ≥8,235 acre feet of Municipal Quality Water per year to a local water purveyor
- Provides sustainable 40-year supply to Affected Municipalities at reduced rates
- Prevents or reduces spread of contamination
- Restores the natural resource for the benefit of the Affected Municipalities
- Replaces water lost to concentrate streams in Zone A and Zone B

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# PROJECT BENEFITS
## (Beyond Requirements of Consent Decree)

- Contribution of land and water rights for plant sites by KUCC and JVWCD
- Integration with CERCLA remediation program
- Water quality enhancement at JVWCD's expense
- Use of JVWCD's existing and future supply and treatment infrastructure to back up Zone B and Lost Use Plants

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# PROJECT BENEFITS

## (Beyond Requirements of Consent Decree)

- **Substantial additional cash contributions by KUCC and JVWCD**

## Project Funding [a] ($Millions)

| Project Component | ILC[b] | Lost Use | KUCC | JVWCD | TOTALS |
|---|---|---|---|---|---|
| Zone A | $24.05 | $0 | $14.8 | $5.9 | $44.75 |
| Zone B | $24.05 | $0 | $4.5 | $11.1 | $39.65 |
| Lost Use | $0 | 13.2[c] | $0 | $6.3 | $20.0 |
| TOTALS | $48.1 | $13.2 | $19.3 | $23.3 | $103.9 |

(a) In October 2002 dollars. Includes both construction and O,M&R cost NPV for 40 years.
(b) Irrevocable letter of credit (September 2003 value).
(c) $0.7 million to UDEQ for Trustee expenses.

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# PROJECT BENEFITS
## (Beyond Requirements of Consent Decree)

- Use of JVWCD storage and distribution facilities to deliver water to Affected Municipalities
- Commitment by KUCC to accept and dispose of Zone A and, if necessary, Zone B concentrates using KUCC infrastructure
- JVWCD experience and expertise in constructing and operating a major, integrated public water system
- Development and operation by a public entity -- no “profit” or “return on investment” component in project economics
- Gain experience with R/O technology that will enhance and expedite future public water supply projects

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# Other Issues

- Shallow groundwater level impacts
- Principal aquifer groundwater level impacts
- Potential contaminant migration
- By-product discharge to Great Salt Lake and/or Jordan River via UPDES permitted outfalls

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